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Interaction of Electric Fields with Vascular Cells TOLOO TAGHIAN, University of Cincinnati, Physics Department, ABDUL SHEIKH, DARIA NARMONEVA, University of Cincinnati, Biomedical Engineering Department, ANDREI KOGAN, University of Cincinnati, Physics Department — Electrical stimulation has been shown to be effective in improving healing rate of the non-healing or slow-healing wounds, a significant high-cost clinical issue. In order to optimize this process, identifying the mechanisms underlying the interaction of vascular cells with electric field (EF) is of interest. We have developed a 3D model of the cultured cells to simulate EF distribution in the cell membrane. The electrical stimulation of cells has been performed using our novel device that generates EF without any contact between electrodes and cells. The results indicate that cells respond to EF by releasing a specific growth factor (PlGF) which is important for blood vessel growth during wound healing.

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